PERIPHERAL BLOOD LYMPHOCYTE SUBPOPULATIONS AFTER SMALL BOWEL PEDIATRIC TRANSPLANTATION

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BACKGROUND

In clinical practice, immune monitoring of peripheral blood subpopulations after solid organ transplantation is not fully implemented yet. It has been reported as useful to prevent infections in adult kidney transplantation. Because of the large size of lymphoid tissue transplanted and the intensity of immunosuppressive therapy, small bowel transplantation (SBT) may benefit from the serial analysis of lymphocyte subpopulations to prevent transplant complications.
The aim of this pilot study is to describe changes in immunological populations of paediatric SBT at defined timepoints.

METHODS

We prospectively monitored peripheral blood lymphocyte subsets from children who underwent SBT (n=6, 80% males, age: 1-18 years) at 1, 3, 6, 12 months after transplantation.

Total number and percentages of peripheral blood T, B and natural killer lymphocytes were measured by flow cytometry (CD3-FITC, CD4-PerCP, CD8-BV510, CD19-PeCy7 and CD16/56-PE; BD; FACS Canto II).
Interindividual differences were defined by a negative value from the following calculation: median – interquartile range.

RESULTS

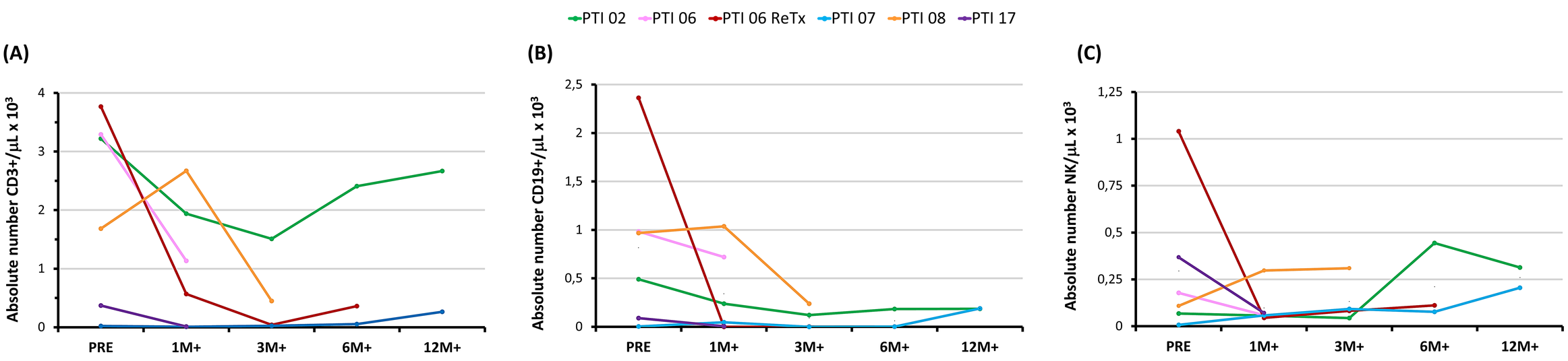

Figure 1. Absolute number dynamics of T CD3+ (A), B CD19+ (B) and NK (C) lymphocytes before small bowel transplantation (PRE) and at 1, 3, 6 and 12 months (1M+, 3M+, 6M+ and 12M+) after transplantation. Due to the intense induction therapy, lymphopenia was maintained in most of the patients at 1 and 3 months after SBT, with diverse dynamics for all populations when comparing different timepoints and patients. PTI: transplanted patient code; ReTx: retransplantation

Table 1. Interindividual differences before small bowel transplantation (PRE) and at 1, 3, 6 and 12 months (1M+, 3M+, 6M+ and 12M+) after transplantation. We observed marked interindividual differences in T and B populations pre-transplant and at 1, 3, 6 months after SBT, grouped by age. NK subset showed less variation among patients. MED-IQR: median – interquartile range.

CD3	PRE	1M+	3M+	6M+	12M+
MEDIANA	2,45	0,85	0,24	0,36	1,47
IQR	2,58	1,59	0,68	1,18	1,20
MED-IQR	-0,12	-0,74	-0,43	-0,82	0,27

CD19	PRE	1M+	3M+	6M+	12M+
MEDIANA	0,73	0,14	0,06	0,00	0,19
IQR	0,79	0,58	0,15	0,09	0,00
MED-IQR	-0,06	-0,44	-0,09	-0,09	0,18

NK	PRE	1M+	3M+	6M+	12M+
MEDIANA	0,14	0,06	0,09	0,11	0,26
IQR	0,24	0,01	0,07	0,18	0,05
MED-IQR	-0,10	0,05	0,01	-0,07	0,21

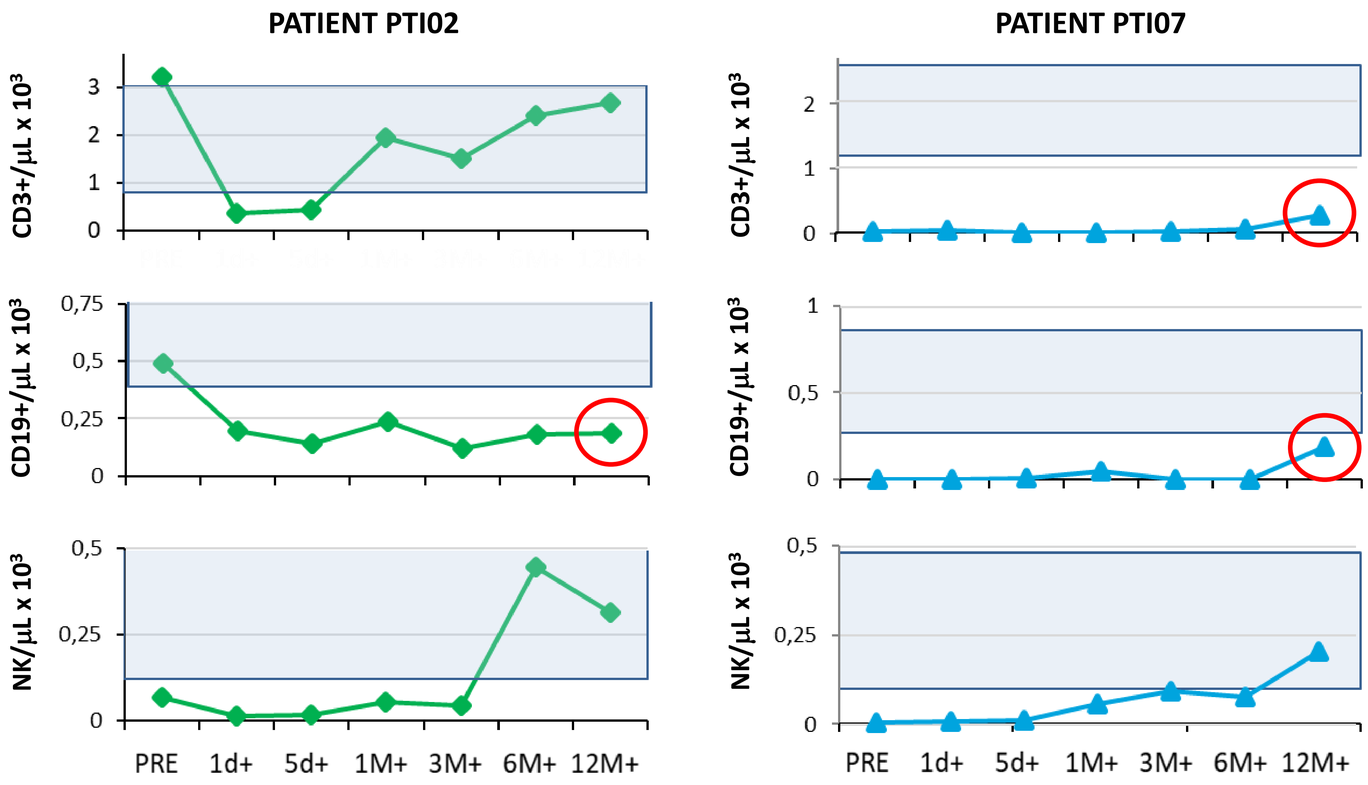

Figure 2. Absolute number dynamics of T CD3+, B CD19+ (B) and NK (C) lymphocytes before small bowel transplantation (PRE) and at 1 , 5 days (1d+ and 5d+) and 1, 3, 6 and 12 months (1M+, 3M+, 6M+ and 12M+) after transplantation. The shaded band shows the reference range by age and values under this range at 12M+ are marked with a red circle. One of the two patients (PTI02) with 1-year follow up did not recover normal cell number for his age after SBT and the other still presented lower B cell number at this timepoint, which can lead to a higher infection risk.

DISCUSSION

Sequential monitoring of peripheral blood lymphocyte subsets might be useful to predict post-transplant complications after paediatric SBT, providing an opportunity for individualizing immunosuppressive/prophylactic therapy in patients with maintained lymphopenia. The limitation of the study is the small cohort size.